BILATERAL OCCURRENCE OF THIRD HEAD OF BICEPS BRACHII ASSOCIATED WITH UNILATERAL VARIATION IN THE COURSE OF MUSCULOCUTANEOUS NERVE - A CASE REPORT

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ABSTRACT

It is very common to see variations in the course of nerves and muscles of the arm. We observed one bilateral concurrent variation in the course of musculocutaneous nerve and origin of biceps brachii muscle. Musculocutaneous nerve, after piercing the coracobrachialis muscle gives one communicating branch to the median nerve and then supply the third head of biceps brachii and brachialis muscle in the right upper limb. After that it continues as the lateral cutaneous nerve of forearm. In the left upper limb musculocutaneous nerve is not piercing the coracobrachialis muscle but otherwise following the normal course.

Key Words: Nerve, Musculocutaneous, Median, Biceps brachii, Third head of biceps brachii

INTRODUCTION

Brachial plexus is formed by the anterior primary rami of spinal nerves C5, C6, C7, C8 and T1. The plexus is said to be prefixed when the branches of fourth cervical fibers join the plexus and postfixed when joined by branches from second thoracic nerves. C5 and C6 roots join to form upper trunk. C7 root forms the middle trunk. C8 and T1 roots join to form lower trunk. Each trunk divides into ventral and dorsal divisions. Ventral division of the lower trunk forms medial cord. Dorsal divisions of all the three trunks join to form posterior cord. Ventral divisions of upper and middle trunk joint to form lateral cord. Musculocutaneous nerve (MCN) is the branch from the lateral cord of the brachial plexus. The nerve initially accompanies the axillary artery, pierces the coracobrachialis muscle, and then passes downwards between the biceps brachii and brachialis. It supplies coracobrachialis, biceps brachii and medial part of brachialis muscles. Below the elbow joint the nerve is continuous as the lateral cutaneous nerve of the forearm. It should be noted that the brachial plexus is the most variable part of the peripheral nervous system [1]. The prevalence of variations ranges from 12.8 up to 53% [1, 2]. Variations of the musculocutaneous nerve may occur in 6.25% of cases [3].

CASE REPORT

During routine dissection for medical undergraduates, in a middle aged Indian cadaver we observed a variation in the course of musculocutaneous nerve associated with third head of biceps brachii muscle. In the right upper limb, musculocutaneous nerve after piercing the coracobrachialis muscle gives one communicating branch to the median nerve to supply the third head of biceps brachii and brachialis muscle. In the left upper limb, third head of biceps brachii associated with normal course of musculocutaneous nerve except that it is not piercing the coracobrachialis. After that it continues as lateral cutaneous nerve of forearm in the right and the left upper limb.

DISCUSSION

Variations in the course and termination of musculocutaneous nerve are common. As reported by Venieratos D. and Anagnostopoulou S. [4], there are three types of communications between musculocutaneous and median nerve with reference to coracobrachialis muscle. In one type, communication was proximal to entry of mus-
cuculocutaneous nerve into coracobrachialis. In second
type communication was distal to entry of musculocu-
taneous nerve into coracobrachialis. In third type nerve
and communicating branch did not pierce the coraco-
brachialis muscle. According to Loukas M. and Aqueelah H.
four different patterns of communication exist between
musculocutaneous and median nerve: Type I (54 communi-
cations, 45%). The communications were proximal to
the point of entry of musculocutaneous nerve into
coracobrachialis. Type II (42, communications, 35%) the
communications were distal to the point of entry of the
MCN into the coracobrachialis; type III (11 communications,
9%): the MCN did not pierce the coracobrachialis;
and Type IV (9 communications, 8%): the communi-
cations were proximal to the point of entry of the MCN into
the coracobrachialis and additional communication took
place distally. [5]

In this case report the findings coinside with second type
of communication mentioned by Venieratos D. and Anag-
nostopoulo S. and Type II by Loukas M .and Aqueelah H.,
in the right upper limb. The lateral root of the MN
carries fibres that may pass through the MCN, and a
communicating branch from the later usually joins the
MN in the lower third of arm[13].In the left upper limb
it coinside with Type III by Loukas M .and Aqueelah H.

A supernumerary head of biceps brachii is the most fre-
quently occurring muscular variation in the upper limb,
prevalence is upto 22.9%. [6] Variations include bifurcate
origin of long head [7], occurrence of third head [8-9]
and occurrence of four heads [10-11].Greig, Anson and
Budinger found one or more accessory heads of biceps
brachii in 28 (21.5 %) of 130 muscle studied. In most of
them extra head was arising from middle third of humer-
us. In another two it arose from intertubercular groove
and in other five from the pectoralis major.

In this case the third head is arising from the middle
of the shaft of humerus.

The clinical relevance of such variations might also be
correlated to entrapment syndromes. Entrapment of
MCN is rare and has its origin either in physical activ-
ity according to Falsenthal et al., 1984[14] or in violent
passive movements of arm and forearm according to Kim
and Goodrich, 1984[15 ]. This knowledge may prove
useful for clinicians in order to avoid an unnecessary
Carpal tunnel release [4].

Knowledge of these variations is important in traumato-
logy and in plastic and reconstructive surgeries.

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**Figure 1:** Right upper limb - Musculocutaneous nerve after piercing coracobrachialis muscle gives a communicating branch to median nerve associated with third head of biceps brachii

MN: Median Nerve  
MCN: Musculocutaneous Nerve  
CM.BR.: Communicating Branch  
BB: Biceps brachii muscle  
CB: Coracobrachialis muscle  
THBB: Third head of Biceps brachii muscle

**Figure 2:** Left upper limb - Musculocutaneous nerve does not pierce coracobrachialis muscle associated with third head of biceps brachii

MN: Median Nerve  
MCN: Musculocutaneous Nerve  
BB: Biceps brachii muscle  
CB: Coracobrachialis muscle  
THBB: Third head of Biceps brachii muscle